IN THE CLAIMS

Re-write claims 4, 7, 8, 9. and 10 as follows:

Listing of Claims:

1. (Original) A method of correcting data frames for dynamic phase errors in magnetic resonance imaging comprising the steps of:

a) acquiring a plurality of high-resolution data frames,

b) acquiring with each high-resolution data frame a low-resolution phase reference navigator, and

c) rephasing each high-resolution data frame in *k*-space with a convolution with the Fourier transform of the phase conjugate of the low-resolution phase reference navigator.

2. (Original) The method as defined by claim 1 wherein step c) includes the steps of:

c1) calculating for each data frame a Fourier transform of a phase conjugate of the phase reference navigator as a refocusing kernel for the data frame, and

c2) convolving in *k*-space the high-resolution data frame with the refocusing kernel to phase correct the high-resolution data frame.

3. (Original) The method as defined by claim 2 wherein step c) utilizes a gridding reconstruction of each high-resolution data frame.

4. (Currently Amended) The method as defined by claim 3 wherein the acquired MRI data, [[d]] **d**, is:

$$\mathbf{d} = \mathbf{GFPm} = \mathbf{RPm}$$

where **d** is a $CR \times 1$ vector containing the *k*-space data, **m** is a $N^2 \times 1$ vector containing the object magnetization in Cartesian coordinates, and **P** ($CN^2 \times N^2$), **F** ($CN^2 \times CN^2$) and **G** ($CR \times CN^2$) are matrices respectively representing image-space phase corruption, discrete Fourier transform, and resampling from a Cartesian grid onto the *k*-space trajectory, and **R** is length of k-space interleaved trajectories.

5. (Original) The method as defined by claim 4 wherein the reconstructed image is a least squares estimate:

$$\hat{\mathbf{m}} = (\mathbf{P}^*\mathbf{R}^*\mathbf{R}\mathbf{P})^{-1}\mathbf{P}^*\mathbf{R}^*\mathbf{d}$$
$$= \mathbf{M}^{-1}\mathbf{P}^*\mathbf{R}^*\mathbf{d}$$

where * denotes conjugate transpose.

6. (Original) The method as defined by claim 5 wherein the least squares reconstruction is estimated as:

$$\tilde{\mathbf{m}} = \mathbf{P}^*\mathbf{R}^*\mathbf{d}.$$

7. (Currently amended) The method as defined by claim 6 wherein *k*-space refocusing of each data frame includes:

A) initialize a zero-filled $N \times N$ matrix [[(]]which will accumulate the refocused spectrum[[)]],

B) for each interleave:

a') ~~(a)~~ Reconstruct the navigator data in *k*-space ($n \times n$),

b') ~~(b)~~ Zero-pad (a) by a factor of 2 ($2n \times 2n$),

c') ~~(c)~~ Inverse Fourier transform (b),

d') ~~(d)~~ Calculate the phase conjugate of (c),

e') ~~(e)~~ Fourier transform (d) [[(]]to get the refocusing kernel[[)]],

f') ~~(f)~~ Reconstruct the high-resolution data frame in *k*-space at the final image resolution ($N \times N$),

g') ~~(g)~~ Convolve (f) with (e) (refocusing step),

h') ~~(h)~~ Add (g) to the sum accumulating in step ~~(1)~~ A),

C) inverse Fourier transform the cumulative sum from (h) to get ~~the~~ a refocused image.

8. (Currently Amended) The method as defined by claim 7 wherein step ~~a)~~ a') and step ~~b)~~ b') include acquiring information relevant to time-varying data corruption, and ordering of data frames based on this information thereby promoting smooth, non-periodic modulation of data in the spectral domain.

9. (Currently Amended) The method as defined by claim 7 and further including before step ~~(e)~~ (c') the step of:

(b1) weighting each image-space sample in the plurality of data frames by magnitude of the low-resolution ~~phone~~ phase reference navigator acquired therewith.

10. The method as defined by claim 9 wherein

$$Qd = QRPm$$

where [[Q]] $\underline{Q}$ is a preconditioning matrix that provides desired image-space weighting.

11. The method as defined by claim 10 wherein least-squares solution, $\hat{m}_Q$, is given by:

$$\hat{m}_Q = (P^*R^*Q^*QRP)^{-1} P^*R^*Q^*Qd.$$

12. The method as defined by claim 1 and further including the step of:
d) summing the phase-corrected high resolution data frames.